fourth mandibular tooth; but the dentition as a whole is suggestive of the alligator type.

The only fossil lizard from the Siwalik hills is the *Varanus sivalensis* of Falconer, and the only serpent *Python molurus* (Linn.), known from vertebræ collected by Mr. Theobald in the Punjab. This part of the work concludes with a list of memoirs relating to the reptile types described.

The eighth part is a description of the Siwalik fishes. A majority of the remains which have been determined belong to the families Ophiocephalidæ and Siluridæ, which at the present day are important elements in the Indian fish-fauna. But some of the fossil Siluroid fishes have marked affinity with African types. The sharks of the Punjab and Pegu are referred to *Carcharias* and *Carcharodon*. The only ray described is the *Myliobatis curvipalatus*, a new species from the Eocene of Katch.

Descriptions follow of *Capitodus indicus*, a species of *Ophiocephalus*, a new species of *Clarias* (*C. Falconeri*), a new species of *Heterobranchus* (*H. palæindicus*), *Chrysichthys Theobaldi*, *Macrones aor*, *Rita grandiscutata*, two species of *Arius*, and *Bagarius Yarrelli*. Another fish is provisionally referred to the Cyprinodontidæ, and *Diodon Folii* is a new species from the Eocene of Ramri Island. The part concludes with a preface to the work, which states that the Siwalik and Narbada Vertebrata are now described. There is a table of contents and index to the volume, and introductory observations in which additional notes are given upon a number of the types described, while a new species, *Mastodon Cautleyi*, is illustrated with several woodcuts. The author may be congratulated on the completion of his labours and on the excellent illustrations which the later work contains. It is a great advantage to all students to be able to consult these figures; and the author's descriptions direct attention to the more striking characters of the fossils. Probably succeeding writers may take different views concerning the nomenclature and even the affinities of some of the fossils, but will acknowledge their obligation to Mr. Lydekker for bringing the Vertebrata of the Siwalik rocks and the problems they suggest once more under the notice of naturalists, in a complete history.

Les Glandes du Pied et les Pores Aquifères chez les Lamellibranches. Par le Dr. Théodore Barrois. 4to. Lille, 1885.

Considering the nature of the byssus of the Mollusca it may perhaps seem rather curious that any doubt should ever have existed as to its origin and significance. It has no doubt been generally regarded as the secretion of peculiar glands, but naturalists of eminence have chosen to give it a very different interpretation, namely that it consists of a bundle of dried or chitinized muscular fibres. This idea seems to have originated with De Blainville in 1825, and was more or less distinctly supported by J. Müller and Wagner, and at a later date by Leydig, who declared, in 1856, that "what is called the byssus consists of chitinized muscular fibres." The last effort in this direction was made by Nathusius Königsborn in 1877, so that the notion has persisted to a tolerably recent date.

Soon after the last-mentioned date MM. Carrière and Théodore Barrois undertook independently elaborate reseaches for the purpose of settling the question, and the description of the investigations of the latter zoologist forms the first part of the volume before us. M. Barrois has examined over sixty species of bivalve Mollusca belonging to the most various groups, and the result of his investigation has been to convince him that the byssus is certainly a secreted organ, and that traces of it are to be found in nearly all the families of the Lamellibranchiata. In its most complete condition it consists of—1, the byssus itself; 2, the groove with its glands; 3, the canal of the byssus; 4, the cavity of the byssus with its glands. Of these the last is apparently the most important part, as it is there that the materials of the byssus are secreted, and in those forms in which the byssus is highly developed this cavity is divided by a multitude of vertical lamellæ into a number of secondary cavities, each of which gives origin to one of the roots of the byssus. The glands which line this cavity are of two kinds, some continuous with the glands of the groove, and the others of much smaller dimensions, which generally occur only in those forms which have the byssus highly developed. The author seems to be inclined to consider the latter only a modification of the glands of the groove, which of themselves seem to suffice for the production of a true byssus.

Upon all these points and many others M. Barrois furnishes us with very full information, and his work ought finally to set at rest the question of the true nature of the byssus.

The second section of his book treats of a subject, the importance of which was forced upon him during his investigation of the glands of the foot in the bivalve Mollusca, namely, "the introduction of water into the circulatory system of the Lamellibranchiata through the so-called *pori aquiferi*." This is a subject upon which a greater variety of opinion has prevailed than even with regard to the origin and nature of the byssus, and the analysis of the literature relating to it given here by M. Barrois shows to how great an extent it has attracted the attention of naturalists. The author agrees with those who maintain that there is no intermixture of water with the blood of the Mollusca; he denies the existence of the intercellular passages destined to facilitate this intermixture, described by several writers, and declares the supposed *pori aquiferi* of other naturalists to be the apertures of the byssogenous apparatus, having no communication with the lacunar system of the foot. The organ of Bojanus he considers to be already put out of court by the researches of many naturalists, and hence he concludes that there is no direct communication between the exterior and the circulatory system, and that the blood is never mixed with water. The turgescence of the foot. which was supposed to be due to the influx of water into the circulatory lacunæ, he regards, with Fleischmann and Ray Lankester, as caused by the sudden transfer of blood from the great reservoirs of the mantle to the spongy tissue of the foot.

We have given here only a very imperfect notion of the contents of this volume, which gives the detailed results of some admirable work upon two matters of considerable importance in the natural

history of the Mollusca. The book is well and fully illustrated with two plates containing numerous figures, mostly showing the appearances seen in thin sections of the parts under consideration.

Annual Report and Proceedings of the Belfast Naturalists' Field-Club, 1884–85. Series ii. vol. ii. part v. 8vo. Belfast: 1885.

The Annual Report of the Society's affairs is followed by a pleasing *résumé* of the summer and autumn excursions and of winter indoor meetings. Besides the Address, by Mr. W. H. Patterson, on the ancient literature and history of Ireland, there are notes and papers:—On the Mosses of Mourne Mountains, on the Gilled Fungi of North Ireland, and on a quantity of Deer's Horns found near Maralin, by the Rev. H. W. Lett; on the Lignites and Silicified Wood of Lough Neagh, by Mr. W. Swanston, F.G.S.; on an ancient Helmet of Iron and Bronze from one of the Crannoges of Antrim (?); and on the Scale Mosses and Liverworts of Co. Down, by the Rev. C. H. Waddell. The meteorological summary for 1885 and list of members &c. complete this part of the 'Proceedings.' Appendix ix. follows, containing:—

1. "The Recent Ostracoda of Belfast Lough," by Dr. S. M. Malcolmson. Besides notes on specimens and species, we have here two elaborate tables, showing the distribution of Ostracoda in the Irish Channel and Belfast Lough, with positions, depths, and bottoms of the dredgings, and references to the descriptions and figures of the many known species met with. Six forms new to Britain are recorded; three of these are new species and are duly described and figured, namely *Loxoconcha cuneiformis*, *Paradoxostoma truncatum*, and *Bythocythere pavo*; and one new to Britain is also figured, *Cytherideis foveolata* (pl. xxvi.). Dr. G. S. Brady, having aided the author in his researches, is duly acknowledged.

2. "The Fungi of the North of Ireland, Part I.," by H. W. Lett, M.A. (Trin. Coll. Dubl.), after an appropriate introduction enumerates 581 species, with their localities and references.

3. "Foraminifera of the Belfast Naturalists' Field Club Cruise off Belfast Lough, in the Steam-tug 'Protector,' June 1885; also Foraminifera found by Dr. Malcolmson at Rockport, Belfast Lough," by Joseph Wright, F.G.S. In this memoir the author, including, with corrected nomenclature, the Foraminifera recorded in his former paper (Proc. Belfast Nat. Field Club, Appendix, 1876–77), enumerates all the species now known on the north-east part of the Irish coast. Besides notes on some of the species he gives a long table showing distribution and relative abundance, and supplies a plate of twelve of the most interesting species (pl. xxvi.). The help given by Mr. H. B. Brady, F.R.S., in this work, and by Dr. Malcolmson in the illustrations, is acknowledged.

4. "A List of the Cretaceous Foraminifera of Keady Hill, County Derry," by Joseph Wright, F.G.S., is an important addition to the author's researches upon the Microzoa of the Irish Chalk, &c. (Proc. Belfast Nat. Field Club, 1874, Appendix, p. 73). Twenty-five species new to the Cretaceous fauna of Ireland are indicated among the many here enumerated; and five new forms are illustrated, with ten